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COUNCILMANIA LAFLEURI NOT A NEW AMOEBA

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The description by Kofoid and Swezy (1921) of a supposedly new amoeba occurring in the intestinal tract of man and hitherto classified as *Entamoeba coli* has necessitated a critical study of this class of cases. Kofoid and Swezy claim this amoeba is pathogenic and that it differs from *Entamoeba coli* in a number of characteristics in both the free and encysted stages. During the past year I have had eight cases, pronounced by Dr. Kofoid's laboratory as *Councilmania lafleuri,* which were studied carefully in the free and encysted stages, comparing them for checking purposes with specimens from *Entamoeba coli* infections which also had been pronounced by Dr. Kofoid's laboratory as *Entamoeba coli.*

Kofoid and Swezy give the following as the available diagnostic characteristics, and I will consider them seriatim. In the original they are as follows:

Councilmania lafleuri	*Endamoeba coli*
Free Stage	
1. Very active, pseudopodia thrust out suddenly, ectoplasm sharply separated from endoplasm.	1. Sluggish, ectoplasm not sharply separated from endoplasm.
2. Red blood corpuscles ingested readily.	2. Red blood corpuscles not ingested normally.
3. Peripheral chromatin in a thin layer, karyosome large, eccentric, with halo, or often seen in premitotic condition with chromatin dispersed in granules in a sphere, ring, or skein without halo and often central.	3. Peripheral chromatin in a thicker layer, karyosome small, spherical, with halo, generally eccentric.
Encysted Stage	
4. Cyst wall very thick.	4. Cyst wall thin.
5. Spheroidal, ellipsoidal or asymmetrical, less often spherical.	5. Generally spherical.
6. Less readily stained.	6. More readily stained.
7. Glycogen body more resistant to iodine.	7. Glycogen body stains readily in iodine.
8. Nuclei with little peripheral chromatin and large, generally central or but slightly eccentric, dispersed karyosome.	8. Nuclei with more peripheral chromatin and small, eccentric, massed karyosome.
9. Chromatoidal bodies less acicular in early stages, fasciculate, massed centrally in later stages and contributing to chromophile buds.	9. Chromatoidal bodies more distinctly acicular, with less central massing and no relation to segregation of chromophile cytoplasm.
10. Chromophile ridge forms a bud through a pore in the cyst wall, which detaches uninucleate amoebulae.	10. Budding unknown.

1. Any attempt to pass on amoebae, based on motility and appearances of pseudopodia or differentiations of endoplasm and ectoplasm, is liable to great error. A careful study of a case of either *histolytica* or *coli* infection will show under different conditions very great differences in the motility and appearance of parasites. While it is generally taught to the contrary, it is nevertheless a fact that *Entamoeba coli,* under favorable conditions, may exhibit the same active motility that is considered so characteristic of *Entamoeba histolytica.* I could obtain the same motility in check cases that was seen in the so-called Councilmania.

2. In none of the parasites that I examined were red blood cells present. It is possible that Kofoid and Swezy were dealing with mixed infections with *Entamoeba histolytica* as suggested by Wenyon (1922), or that vacuoles were mistaken for red cells, an error readily and frequently made.

3. In the free state no differences could be noted as far as the nucleus could be studied in unstained specimens.

4. There appeared to be no difference in the thickness of the cyst walls in the Councilmania and check cases.

5. No difference in contour could be demonstrated between the cysts of Councilmania and the *Entamoeba coli* check cases, nearly all being spherical. It is significant that Kofoid and Swezy describe 12 per cent. of the cysts of Councilmania as being asymmetrical while the cysts of *Entamoeba coli* were generally spherical. In my cases asymmetrical forms were readily produced by pressure on the cover slip.

6. It is stated by Dr. Kofoid that his attention was drawn to the Councilmania cysts by the fact that they usually took the hematoxylin stain reluctantly and that they were often found as unstained bodies in the preparation. This I could not verify, the cysts taking the stain, both iodine and hematoxylin, as readily as the check cases, in fact the first three cases that were pronounced Councilmania in my series apparently took the stain more readily than usual. Just as many unstained cysts were seen in the *coli* check cases as in the Councilmania. It is not an infrequent observation to encounter amoebic cysts which are difficult to stain and it is noted in other species as well as *coli.*

7. There was no difference in the reaction to iodine of the glycogen body in the Councilmania and *Entamoeba coli* check cases.

8. There was no difference in the peripheral chromatin of the nuclei. There was no difference in the appearance of the karyosome in the Councilmania and *Entamoeba coli* cases. The karyosome described by Dr. Kofoid in the Councilmania differs somewhat from the description usually given of the karyosome in the *coli* but I found examples of this

same karyosome in all cases classified as *coli* in my checks. Dr. Kofoid's pictures of the karyosome are, I believe, the best I have seen.

9. There appeared to be no difference in the chromatoidal bodies of the Councilmania and of the *Entamoeba coli* check cases.

10. Nothing in the slightest manner resembling a budding could be seen in fresh specimens, specimens stained in iodine eosin, in iodine or in hematoxylin, although several thousand cysts were scrutinized very carefully for it.

Dr. Kofoid states that this budding cannot be induced by heat and in this he may be right. He also states "It is not due to trauma and cannot be produced by pressure." With this I take exception. By pressure on the cover slip I have produced budding in practically all of the stages described by Dr. Kofoid in his paper. In some cysts the entire contents were evacuated, in others one or two nuclei. In some the nuclei were seen escaping or partly extruded. Dr. Kofoid states:

> "The intracystic ridge which precedes and attends the early stages of the formation of the bud first appears as a chromophile deeply staining tract which becomes an elevated ridge or keel of varying width which may run half way round the cyst or even further within the wall. It may be a dark narrow thread or a blunt process or a broader ridge. It is generally direct in its course, but is sometimes bifurcated at one end. In optical section it forms a distinct elevated ridge on the contour of the cytoplasm within the cyst wall. . . . Not all cysts have chromatoidal bodies and not all ridges are deeply chromophile, but they are generally more deeply stained than the cytoplasm."

This deeply stained ridge was very clearly brought out in all the specimens where budding was produced by pressure and it resulted of course from the entrance of the stain into the creased wall of the ruptured cyst. This was definitely demonstrated in several instances where the cyst originally would not take the iodine eosin or iodine stain. As soon as the cyst wall was ruptured by the proper degree of pressure the contents of the cyst became immediately deeply stained, the deeply stained ridge described above became prominent and budding occurred.

When I read Dr. Kofoid's article it seemed to me incredible that during the years I have been working with this subject, I had completely overlooked a process so striking as the budding that he describes. However, it often happens that unless one's particular attention is drawn to certain subjects, more or less detail may readily be overlooked. This I know to be so in regard to the character of the karyosome in the *Entamoeba coli,* which my studies started by Dr. Kofoid's article have shown me.

An analysis of my observations would lead me to the following conclusions; first, that there is no foundation for considering *Councilmania lafleuri* a new amoeba; second, that the authors were dealing entirely with *Entamoeba coli,* being led into error by an incorrect interpretation of staining reaction, by according too much weight to characteristics of amoebae in the motile state, and by the production of artefacts in the preparation of specimens.

I must agree with Wenyon (1922) when he adds *Councilmania lafleuri* to the long list of synonyms of *Entamoeba coli.*

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